

Ergonomics in Human-Robot Co-Manipulation Control

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(Workshop Presentation)

Abstract

The talk will present several robot control methods for co-manipulation with humans, where the key element is an optimisation of human ergonomics. The optimization process incorporates biomechanical models and real-time measurements to track and improve various metrics, such as: muscle fatigue, joint torques and arm manipulability. In the first part, the focus is on the application to co-manipulation during physical human-robot collaboration in various practical tasks (e.g., collaborative sawing, polishing, valve turning, etc.). The second part will focus on the application in exoskeletons, where co-manipulation is done while human and robot limbs are physically coupled. Finally, the last part will examine the application in teleoperation, where co-manipulation pertains to the remote robot being commanded by a human operator. In particular, we will present an analysis of impedance-command interfaces in force-feedback tele-impedance.